

FIG. 1.—Waterspout when first observed at 4:45 p. m.

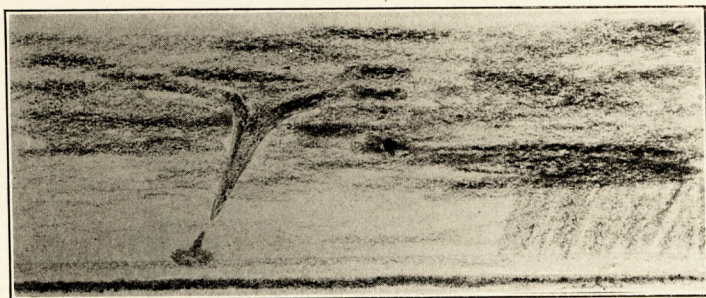


FIG. 2.—Appearance after spout became severed.

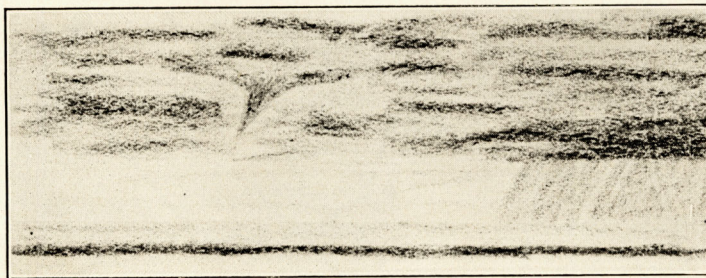


FIG. 3.—Waterspout just before disappearance.



These observations seem to indicate that the lull before the storm extends to heights of 800 to 1,000 meters and that the squall flows in over the surface. The clockwise turning of the wind during the passage of the storm is what would be expected from a counterclockwise whirl

with its southeast quadrant passing northeastward over the observer. It was impossible, on account of clouds, to get observations to heights exceeding 1,000 meters during this period.

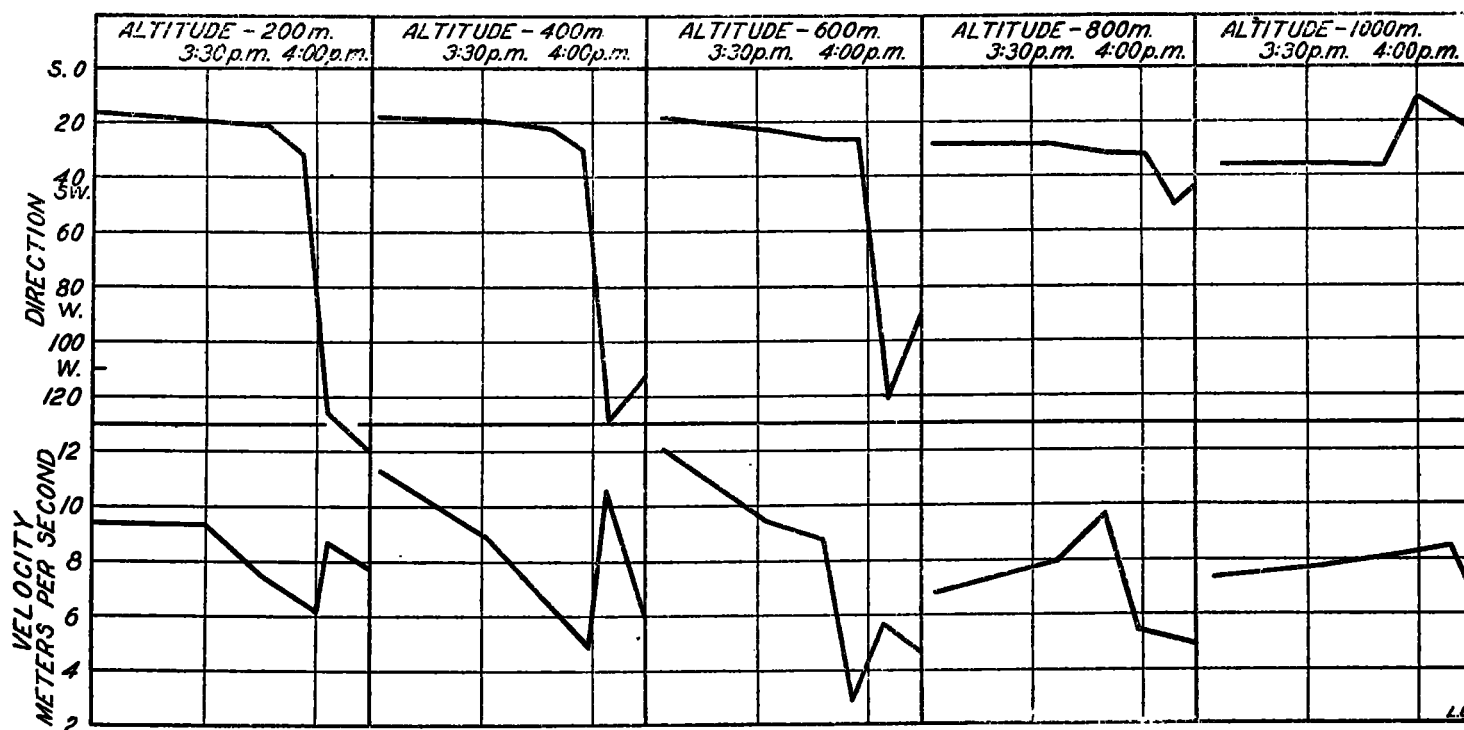


FIG. 3.—March of direction and velocity from 3:30 p. m. to 4:15 p. m. from the six observations.

#### WATERSPOUT OBSERVED AT SAN JUAN, PORTO RICO, SEPTEMBER 10, 1919.

By WILLIAM C. HAINES, Observer.

[Dated Weather Bureau, San Juan, P. R., Oct. 27, 1919.]

An exceptionally well-defined and magnificent waterspout was observed at San Juan, P. R., by a number of people on the evening of September 10. It occurred in connection with a thunderstorm which formed in the late afternoon to the north and northeast of the city and hung almost stationary until late in the evening.

When the waterspout was first observed at 4:45 p. m. by the writer, who was located at the Weather Bureau station approximately 1 mile east of the city, the funnel-shaped cloud extended from a dark mass of storm cloud on the outer edge of the thunderstorm proper to the surface of the ocean where a swirl of spray was plainly visible. The funnel-like cloud was nearly straight, although it was inclined from the vertical at an angle of from 25 to 30 degrees, the bottom portion extending toward the southwest away from the vicinity of the thunderstorm. (See Fig. 1.) The funnel increased very gradually in diameter from the cloud spray at the surface of the water until just before it entered the base cloud where it rapidly increased in size. The spout remained practically motionless until about 5:00 p. m. when it began to show evidences of dissolving about one-fourth the distance up the column; within a period of five minutes it had become entirely severed, the bottom portion and spray remaining visible for several seconds. (See Fig. 2.) The upper portion of the column gradually shortened and by 5:15 p. m. it had entirely emerged into the general base cloud. (See Fig. 3.) The waterspout formed to the northwest of the station at a distance estimated to be from 5 to 8 miles.

Several peals of thunder were heard between 5:00 p. m. and 5:15 p. m. Rain could be seen falling a short distance to the north, although none actually fell at the station. The clouds in the region of the thunderstorm were apparently from the northeast, while the cumulus and strato-cumulus clouds overhead and in other portions of the sky were from the southwest. The upper clouds during the day had been from the northwest, although none were visible at the time of occurrence of the waterspout. The wind was moderate and from the east during the afternoon until about 4:00 p. m. when it became light and shifted to the southwest and west and so continued during the prevalence of the thunderstorm.

A sharp lookout was kept during the evening but no other spout was observed. Unfortunately no photographs were taken of this waterspout by anybody as far as could be learned.

#### TWO WATERSPOUTS OBSERVED AT RABAT, MOROCCO, ON DECEMBER 18, 1917.

By J. PEYRIGUEY.<sup>1</sup>

[Reprinted from Science Abstracts, July, 1918, pp. 287-288.]

Descriptions are given of two waterspouts associated with heavy cumulo-nimbus cloud, which came up from the Atlantic with a strong southwest wind. Both were at least about 350 meters long, and extended from the cloud to 50 meters above the surface. The first waterspout was about 4 meters in diameter, the second only about 1 meter. Subsequently a heavy thunderstorm was experienced.—R. C.

<sup>1</sup> Comptes Rendus, 166, Jan. 7, 1918, pp. 48-49.